Met Office

NEWS

Australian bushfires help push forecast 2020 CO_2 rise

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A forecast of the atmospheric concentration of carbon-dioxide shows that 2020 will witness one of the largest annual rises in concentration since measurements began at Mauna Loa, in Hawaii, 1958.

During the year the atmospheric concentration of CO_2 is expected to peak above 417 parts per million in May, while the average for the year is forecast to be 414.2 ± 0.6ppm. This annual average represents a 2.74 ± 0.57 ppm rise on the average for 2019. While human-caused emissions cause the CO_2 rise in concentration, impacts of weather patterns on global ecosystems are predicted to increase the rise by 10% this year. Emissions from the recent Australian bushfires contribute up to one-fifth of this increase.

Professor Richard Betts MBE, of the Met Office Hadley Centre and University of Exeter, said: "Although the series of annual levels of CO_2 have always seen a year-on-year increase since 1958, driven by fossil fuel burning and deforestation, the rate of rise isn't perfectly even because there are fluctuations in the response of ecosystem carbon sinks, especially tropical forests. Overall these are expected to be weaker than normal for a second year running."

Weather patterns linked to year-by-year swings in Pacific Ocean temperatures are known to affect the uptake of carbon-dioxide by land ecosystems. In years with a warmer tropical Pacific, many regions become warmer and drier, which limits the ability of plants to grow and absorb CO_2 and increases the risk of wildfires which release further emissions. Along with other weather patterns and human-induced climate change, this has contributed to the recent hot, dry weather in Australia, which played a key role in the severity of the bushfires.

Professor Betts added: "The success of our previous forecasts has shown that the year-to-year variability in the rate of rise of CO_2 in the atmosphere is affected more by the strength of ecosystem carbon sinks and sources than year-to-year changes in human-induced emissions. Nevertheless, the anthropogenic emissions are still the overall driver of the long-term rise in concentrations."

The CO_2 concentrations at Mauna Loa are measured by the Scripps Institution for Oceanography at UC San Diego and the National Oceanographic and Atmospheric Administration (NOAA). Fire emissions are monitored by the Global Fire Emissions Database (GFED).

The 2020 CO_2 forecast is available here.

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